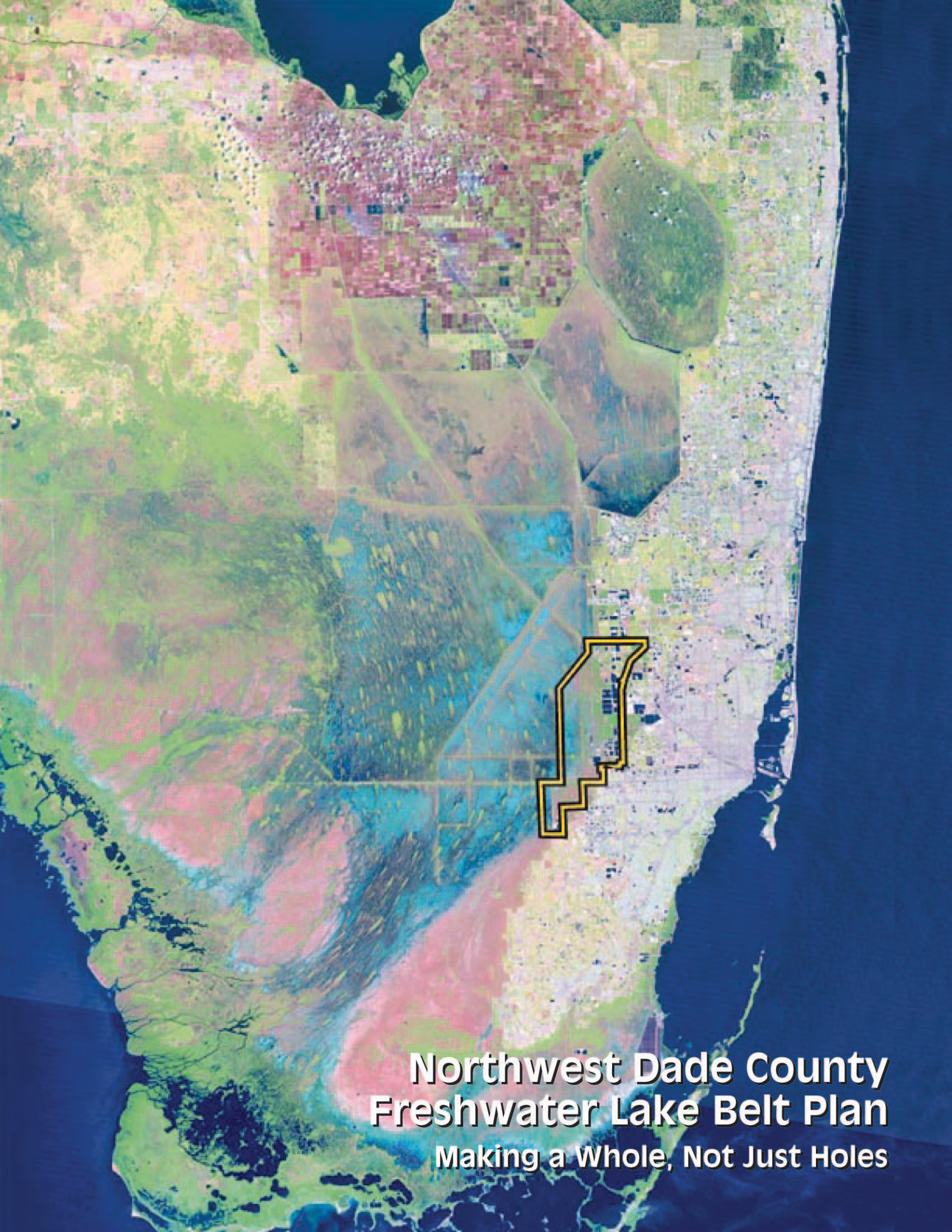

Northwest Dade County Freshwater Lake Belt Plan

Making a Whole, Not Just Holes

Northwest Dade County Freshwater Lake Plan Implementation Committee Members

Valerie Boyd, Committee Chairman	South Florida Water Management District
Jeremy Craft	Florida Department of Environmental Protection
Charles Dusseau	Florida Department of Commerce
Rod Jude	Sierra Club
Michael Kane	South Florida Limestone Mining Coalition
Barbara Lange	Friends of the Everglades (since Nov. 1996)
Janet Llewellyn	Florida Department of Environmental Protection
James Murley	Florida Department of Community Affairs
Bob O'Brien	South Florida Limestone Mining Coalition
Guillermo Olmedillo	Metropolitan Dade County Department of Planning, Development, and Regulation
Joe Podgor	Friends of the Everglades (until Nov. 1996)
John Renfrow	Metropolitan Dade County Department of Environmental Resources Management
Karsten Rist	Florida Audubon Society
Leo Vecellio	South Florida Limestone Mining Coalition
Karl Watson	South Florida Limestone Mining Coalition
Estus Whitfield	Office of the Governor

Ex-officio Members

Senator Mario Diaz-Balart	Florida Senate
Representative Luis Rojas	Florida House of Representatives
Representative Alex Villalobos	Florida House of Representatives
Anthony Clemente	Miami Dade Water and Sewer Department
Gerson Garcia	South Florida Regional Planning Council
Karyn Ferro	Everglades National Park
Austin Forman	Flagler Properties and Investments
Aaron Higer	U.S. Geological Survey
Stephen Lau	FL Game and Fresh Water Fish Commission
Heinz Muller	U.S. Environmental Protection Agency
Melanie Steinkamp	U.S. Fish and Wildlife Service
John Studt	U.S. Army Corps of Engineers

Jim Jackson	Project Manager

Executive Summary

The Northwest Dade County Freshwater Lake Plan Area (commonly referred to as the "Lake Belt Area") is vital to the future of South Florida. Not only is this 89 square mile area located within one of the most environmentally sensitive areas of the state, but it also provides half of the limestone mining resources used in the state every year. This Report presents the results of four years of work by the Northwest Dade County Freshwater Lake Plan Implementation Committee (Committee) to find the proper balance between the economic values of continued rockmining, the environmental values of the freshwater wetlands, the protection of public water supplies, and on-going federal, state and local efforts to restore the greater Everglades ecosystem. It recommends an overall environmental permitting framework to create a coordinated freshwater lake system to replace the current checkerboard mosaic of quarried lakes now being created at a rate of 300 to 400 acres per year.

In 1992, the Florida Legislature passed legislation creating section 373.4149 (4), Florida Statutes, and establishing the Committee. The Legislature directed the Committee to "develop a plan which: (a) enhances the water supply for Dade County and the Everglades; (b) maximizes efficient recovery of limestone while promoting the social and economic welfare of the community and protecting the environment, and (c) educates various groups and the general public of the benefits of the plan." The Plan presented within this Report provides an opportunity for federal, state, and local governments to work in partnership with the private sector to implement a comprehensive plan for the Lake Belt Area.

As directed by the enabling legislation, this Report provides the Committee's recommendations for legislative and regulatory revisions. The implementation of the Plan is being approached in two phases. Phase I provides the overall framework of the Plan and contains specific recommendations regarding: a strategy for streamlining the permitting process for rockmining within the Lake Belt Area; identification of specified areas for mining, mitigation, and additional analysis; development of a dedicated funding mechanism for mitigation; authorization for government and industry land exchanges; and authorization for state agencies to enter into agreements to implement the Plan.

In Phase II a detailed master plan will be developed that further addresses compatible land uses, opportunities and potential conflict; analyzes additional wellfield protection; secures additional funding sources; and considers the need to establish a land authority to further implement the Plan.

View of the Lake Belt Area Looking West from the Homestead Extension of the Florida Turnpike.

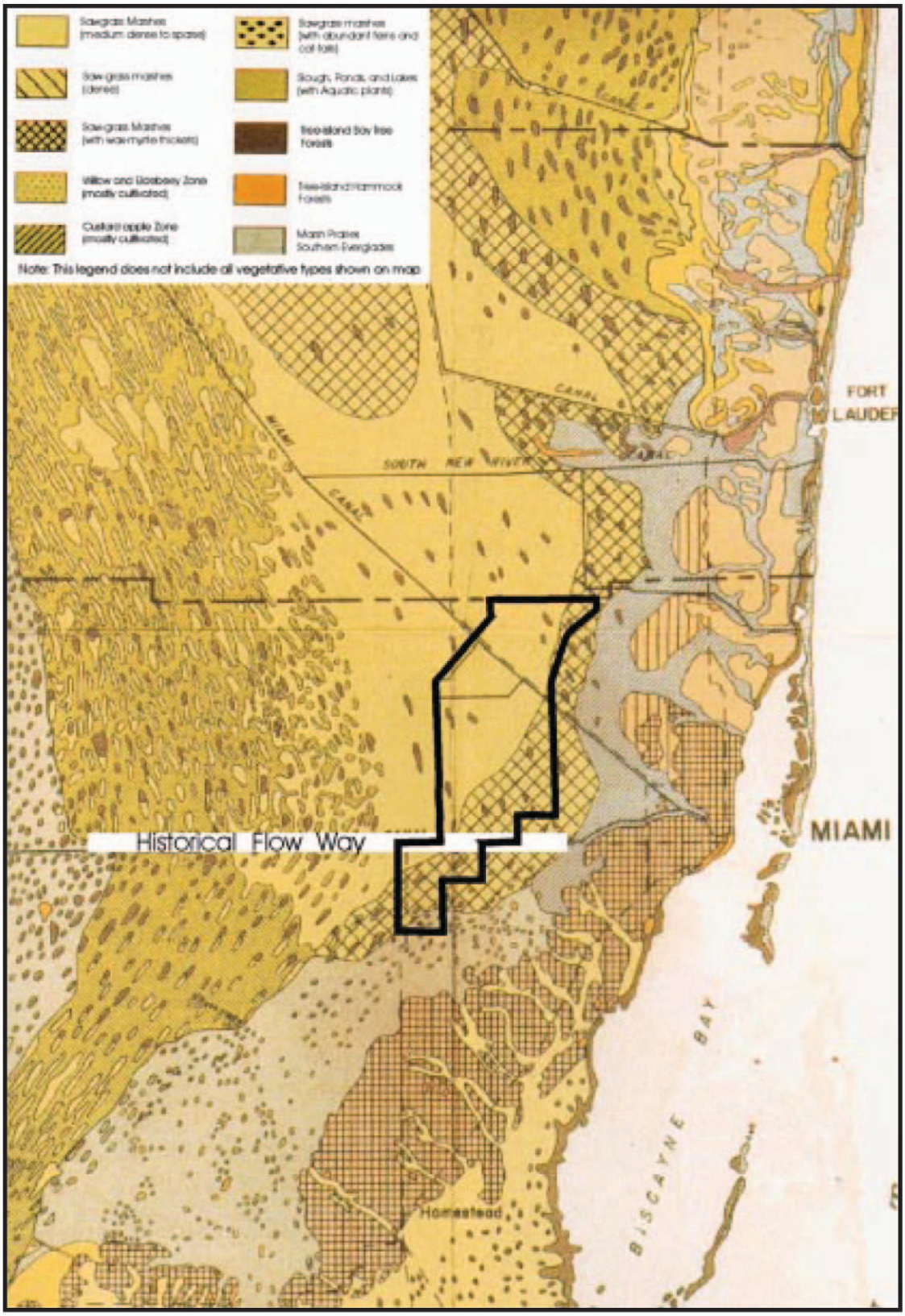

Figure 1. Historic Everglades Vegetation.
This map illustrates predrainage vegetation patterns (1943 John H. Davis). The Shark River Slough predrainage flow-way is depicted with the white box. As shown, the Lake Belt Area resides in formerly deep water marshes, as indicated by the dense sawgrass vegetation.

Introduction

Established in 1992 by the Florida Legislature, the Northwest Dade County Freshwater Lake Plan Implementation Committee (Committee) was charged with the responsibility to "develop a plan which: (a) enhances the water supply for Dade County and the Everglades; (b) maximizes efficient recovery of limestone while promoting the social and economic welfare of the community and protecting the environment, and (c) educates various groups and the general public of the benefits of the plan." (Ch. 373.4149 (4), F.S.) The entire section of the statute is included on page 26. As indicated on the inside of the front cover of this Report, the Committee is comprised of representatives from government agencies, the rockmining industry, and environmental organizations.

This Report is organized into three major sections. The first section provides background information that summarizes the myriad issues that must be considered in the development of a plan for the Lake Belt Area. This includes the need for limestone, the location of the Lake Belt Area within the Everglades ecosystem and on-going restoration efforts, protection of urban water supplies and other infrastructure. The second section discusses the work that the Committee has performed. This includes biological studies to determine wetland values and hydrologic modeling to determine the potential impacts from additional mining. The Committee's recommendations are presented in the last section. ▼

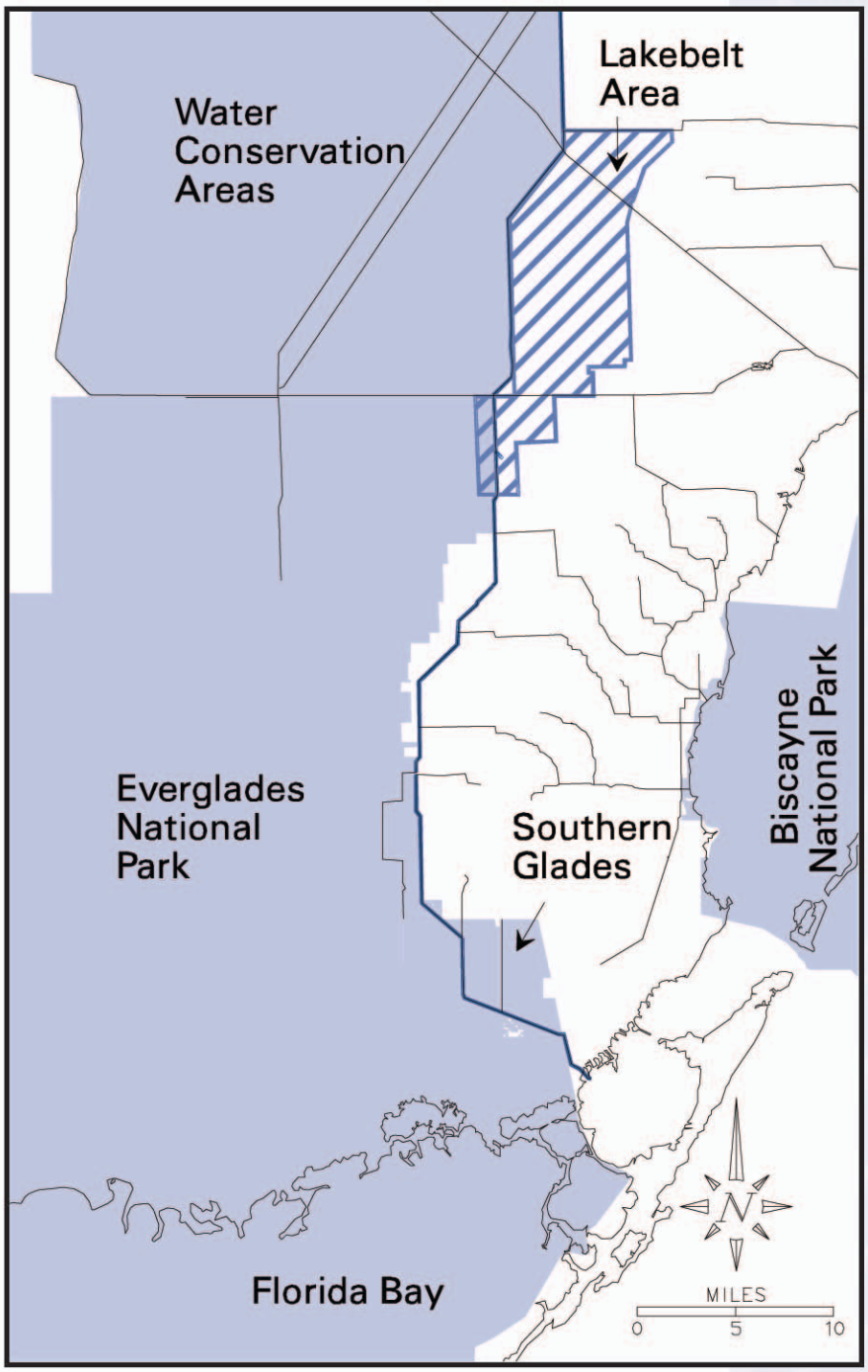

Figure 2. Location of Ecologically Significant Areas Relative to the Lake Belt Area. The management and activities within the Lake Belt Area will have direct implications on the future of the remaining Everglades.

Background

Everglades EcoSystem

As was shown in Figure 1, the majority of lands located within the Lake Belt Area are wetlands that were once part of the historical Everglades watershed and were part of the headwaters of Shark River Slough. Historically, Shark River Slough was a deep water slough which collected flows from the eastern portion of the Everglades, including the western side of the Atlantic coastal ridge, and moved that water to the southwest. After completion of the East Coast Protective Levee System and the adjacent Water Conservation Areas, lands east of the levee were cut off from surface water sheetflow and groundwater levels were lowered to provide flood protection. In addition, northeast Shark River Slough has received significantly reduced flows and the flora and fauna of the greater Everglades ecosystem, as a whole, has been impacted. Figure 2, on the previous page shows the Lake Belt Area, the Water Conservation Areas, Everglades National Park, and other significant natural areas relative to the East Coast Protective Levee System. One of the consequences of the drainage necessary to allow development east of the levee has been an increase in groundwater flows from the Water Conservation Areas and Everglades National Park to the urban drainage network, which ultimately discharges to the ocean.

One of the fundamental prerequisites for restoring the Everglades ecosystem is restoring the hydrology of the area. Hydrologic restoration efforts to date have focused on restoring more natural hydropatterns by implementing rainfall driven water deliveries, improving water conveyance throughout the system, increasing storage capacity, and controlling the amount of water that is lost from the Water Conservation Areas and Everglades National Park. Preventing water loss from the ecosystem through seepage is an integral component of restoration. Due to the proximity of the Lake Belt Area to the eastern edge of the remaining Everglades, the impacts of the lakes on seepage have been given serious consideration in the plan's design, especially with respect to the locations of the lakes. As further discussed in the modeling section, preliminary modeling results suggest that the inappropriate placement of lakes, without additional measures to reduce groundwater flow, has the potential to increase the total volume of seepage out of Water Conservation Area 3B and to reduce the hydropatterns in Water Conservation Area 3B and the Pennsuco wetlands. These effects appear to increase with the proximity of the lakes to the East Coast Protective Levee. During the last several years, the greater Everglades ecosystem has been the focus of much attention. The Committee has had the difficult task of balancing the needs of the rock mining industry and other land uses in the Lake Belt Area with the needs of the Everglades ecosystem. The Committee has worked to develop a plan that would allow for flexibility in management of the Lake Belt Area to be consistent with the on-going efforts to restore the system.

Hydropattern restoration is central to the recovery of several threatened and endangered species in the Everglades, including the endangered wood stork and Cape Sable seaside sparrow. The U.S. Fish and Wildlife Service (USFWS) listed both of these species under the Endangered Species Act because of declining populations due to the disruption of their normal breeding patterns, which resulted from disrupted natural hydropatterns in the Everglades ecosystem. The recovery of these species will require the restoration of hydropatterns in the Water Conservation Areas and Everglades National Park. Mining in the Lake Belt Area must not limit the ability to recover these species in the Everglades.

Nine Mile Pond at the southern tip of the Everglades, surrounded by sawgrass marsh and tree islands.

ROCKMINING

Rock in the Lake Belt Area is one of the few deposits in the State that meets Department of Transportation specifications for hardness and chemical content. The Lake Belt Area supplies essentially all of Dade County's rock and half of the State's rock, sand, and cement for concrete, asphalt and road base. As other mining areas in the State are depleted, the Lake Belt Area is expected to supply an even greater percentage of the State's rock in the future. Every year the Lake Belt Area produces about 35-40 million tons of rock, transforming about 300 acres of melaleuca infested wetlands into lakes about 80 feet deep surrounded by man-made littoral marshes. The total amount of rock produced in the State (including the Lake Belt Area) is 70-80 million tons per year.

Rockmining operations within the Lake Belt Area produce small sorted stones (from 1/8" to 1 1/2" in size), sand, road base (a mixture of sand and small stones), and cement. These are the ingredients of concrete, asphalt, the foundation base material of roads, and a huge assortment of building materials such as concrete blocks and sewer pipes.

Figure 3 shows the lands owned or controlled by rock mining companies within the Lake Belt Area. The

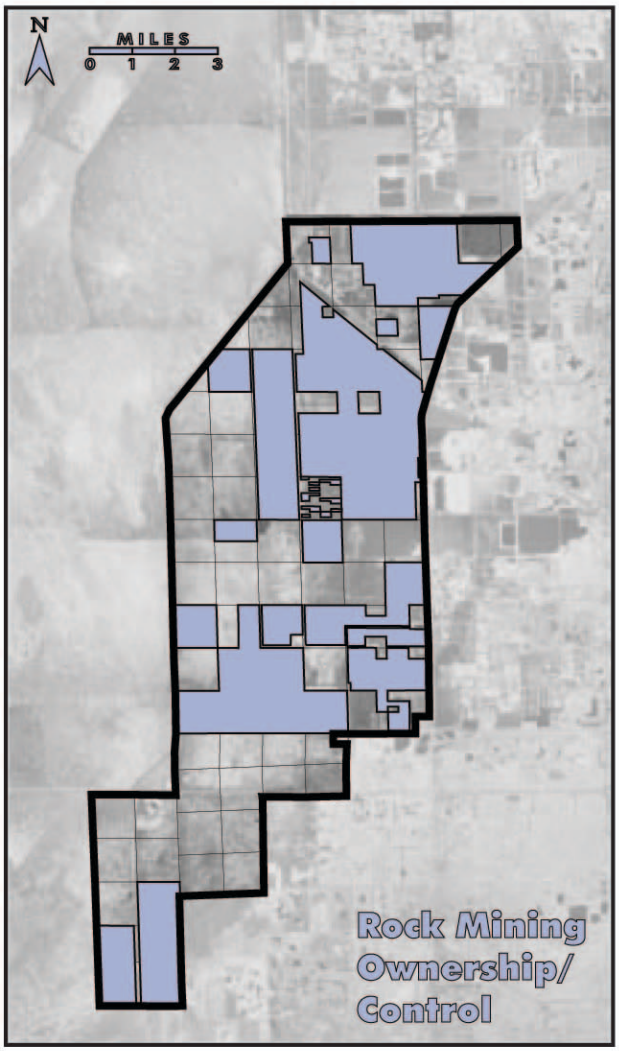

Figure 3. Land Ownership or Control by Rock Mining Companies in the Lake Belt Area.
Rock mining companies own or control 41.6 square miles (26,600 acres) of land which is 47 percent of the total 89.1 square miles (57,000 acres) in the Lake Belt Area. Most of these lands were purchased by the rock industry as mining reserves in the 1960s - 1970s.

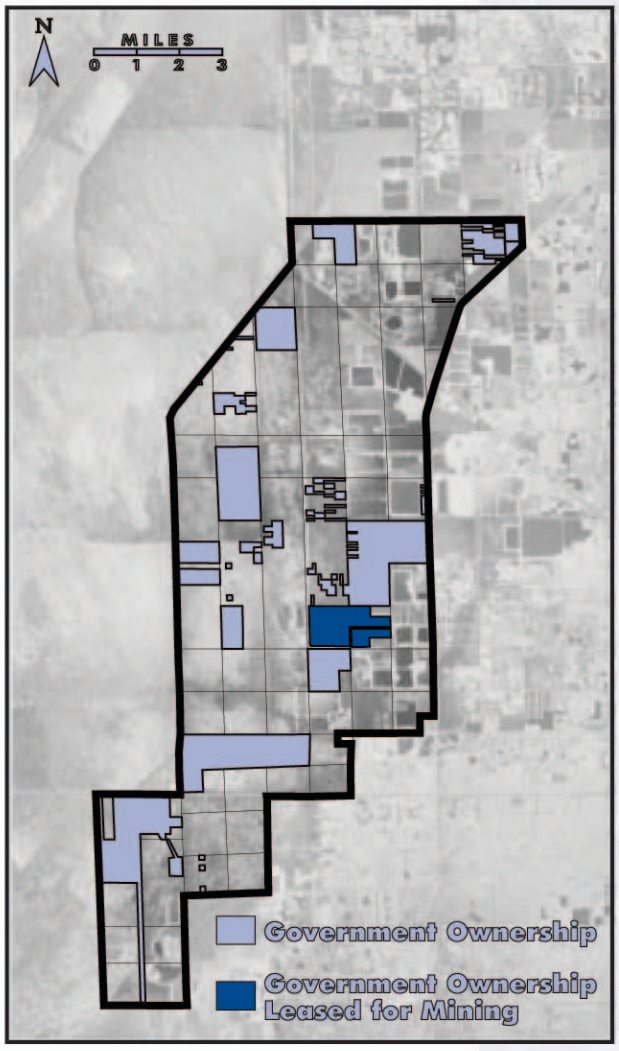

Figure 4. Land Ownership by Government Agencies in the Lake Belt Area.
Various government agencies own 16.6 square miles (10,600 acres) of land which is 19 percent of the total Lake Belt Area. 1.5 square miles (977 acres) of lands currently leased from the government for mining are not included in acreage totals.

companies own or control 41.6 square miles (26,600 acres) of land, which is 47% of the Lake Belt Area. Figure 4 shows the lands owned by government agencies, excluding canals and road rights-of-way. Government agencies own 16.6 square miles (10,600 acres) of land, which is 19% of the Lake Belt Area. This does not include 1.5 square miles (977 acres) of land currently leased for mining. Figure 5 shows industry and government lands combined. Together, they own 66% of the land within the Lake Belt Area.

In 1984, the Florida Legislature passed the Henderson Wetlands Act which expanded wetland regulatory jurisdiction for dredge and fill activities in the State. This act recognized the economic importance of mining in the Lake Belt Area and exempted ongoing mining operations located east of the Dade Broward Levee from state wetlands jurisdiction for a period of ten years. During the 1994 legislative session, the exemption was extended for a reduced area until October 1997. While these lands have been exempt from state permitting, they have continued to be regulated by both Dade County and the U.S. Army Corps of Engineers (USACE). Figure 6 shows the existing and permitted lakes.

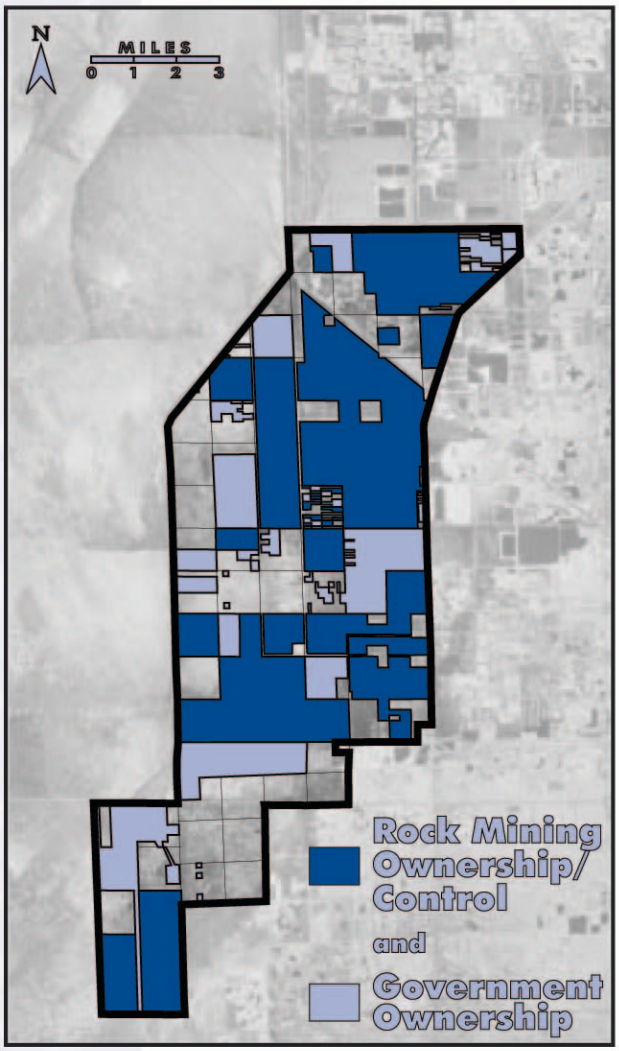

Figure 5. Combined Rock Industry and Government Land Ownership in the Lake Belt Area.
Combined Industry and Government ownership within the Lake Belt Area totals 58.1 square miles (37,200 acres) which is 66 percent of the total 89.1 square miles (57,000 acres) in the Lake Belt Area. This combined ownership provides a critical mass, making a public-private Lake Belt partnership possible.

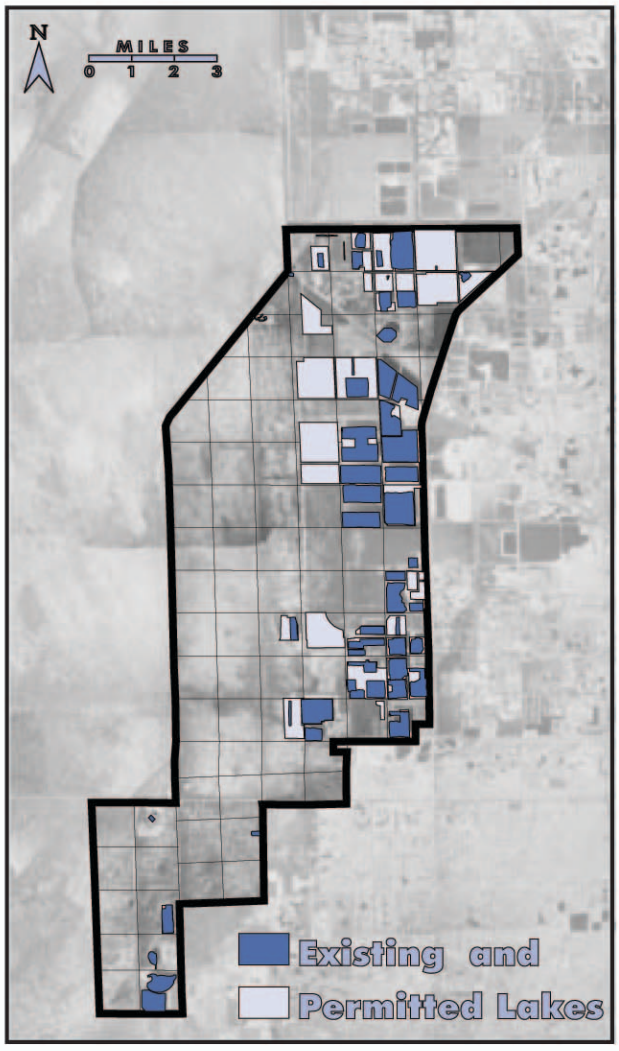

Figure 6. Existing and Permitted Quarry Lakes in the Lake Belt Area.
The mining industry has already created 8.4 square miles (5,400 acres) of quarry lakes. An additional 9.1 square miles (5,900 acres) of quarry lakes are fully permitted for mining in the Lake Belt Area. Existing and permitted lakes comprise 17.5 square miles (11,300 acres) or 20 percent of the total 89.1 square miles (57,000 acres) in the Lake Belt Area.

Water Management

The Central and Southern Florida (C&SF) Project provides flood protection which has allowed the urbanization of significant areas of former Everglades located just east of the Water Conservation Areas. Satellite images of Palm Beach and Broward Counties show urbanization extending all the way to the edge of the Everglades in some areas. The pattern in Northwest Dade County is different in that the mining industry in Northwest Dade County purchased large tracts of land during the 1960s and 1970s and since the mid 1970s the Dade County Comprehensive Plan has designated this area for open land uses and prohibited urban development.

Figure 7 shows the water management canals within the study area. The East Coast Protective Levee System includes L-33, L-30, and L-31N, and separates the Lake Belt Area and lands to the east from Water Conservation Area 3-B (WCA-3B) and the Everglades National Park expansion area. The levees allow higher water levels to be maintained in the Water Conservation Areas and Everglades National Park. Providing the primary drainage of lands to the east of the levees are a series of major canals that include the C-9, C-6, C-4, and others. These levees and canals are operated by the South Florida Water Management District (SFWMD). Smaller, secondary canals operated by Dade County and the South Broward Drainage District drain into the primary canal system.

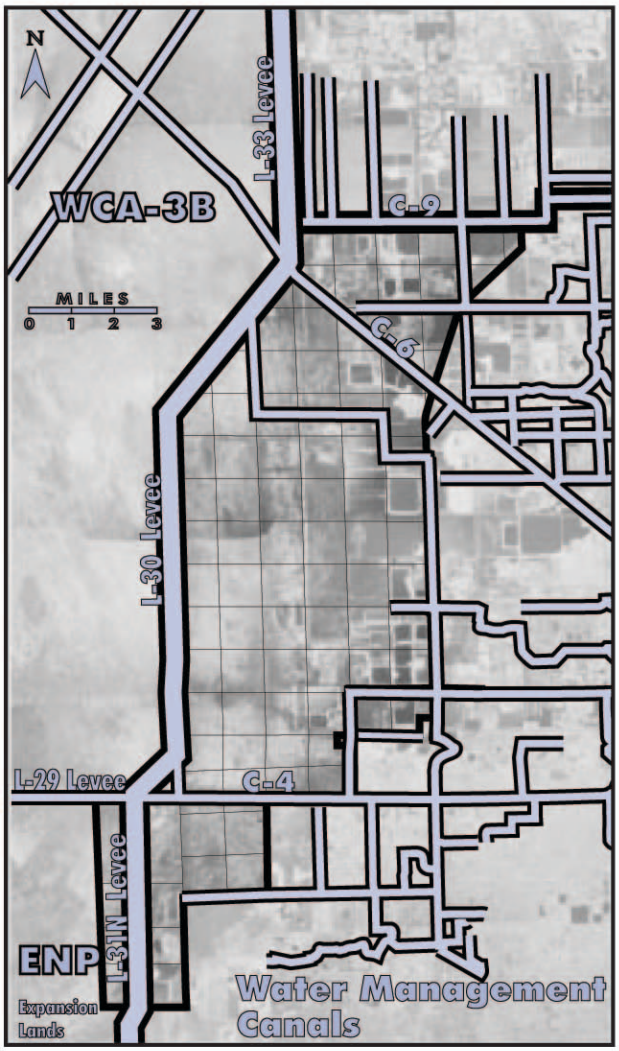

Figure 7. The location of water management canals that provide flood protection by discharging storm runoff and Everglades seepage to Biscayne Bay. The drainage, flood protection, and recharge of the Southeast Coast are provided by a lattice-work of canals which discharge through salinity control structures to Biscayne Bay. These canals also collect and discharge large volumes of seepage from the Everglades. In pre-drainage times, flows of fresh water to Biscayne Bay were predominantly by groundwater.

View of the Snapper Creek Extension Canal Within the Lake Belt Area.

DADE COUNTY WELLFIELDS

The County's wellfields must be considered in the development of a plan in order to protect the quality of water which is pumped from the wellfields to the residents of Dade County. Figure 8 shows the locations of the Northwest and West Wellfields and their outer wellfield protection boundaries. The Northwest Wellfield is the largest water supply wellfield in Dade County and is comprised of 15 wells which collectively pump an average of 90 million gallons per day (mgd) of water. The wellfield has a total installed capacity of 225 mgd. Together with the Hialeah/Preston Wellfield, the Northwest Wellfield has a permitted capacity of 198 mgd and supplies drinking water to most of the residents and businesses in Dade County north of Flagler Street.

The West Wellfield is comprised of three wells and has a total installed capacity of 30 mgd and a planned second phase of an additional 30 mgd. Currently the wellfield is permitted to withdraw a maximum of 15 mgd. Additionally, the County is in the process of installing three aquifer, storage and recovery wells at the West Wellfield which would pump Biscayne aquifer water into the Floridan aquifer for storage and later withdrawal.

In 1985, Dade County established a wellfield protection program which includes restrictions on land uses, septic tank loadings, stormwater discharges, and the use of hazardous materials and hazardous wastes. The interior portions of the wellfield protection area are based upon the average amount of time it would take for a contaminant in the groundwater to reach the wellheads. Restrictions increase as the travel time decreases (i.e. the closer to the wellheads, the more restrictive the prohibitions.) The outer limit of the wellfield protection area extends to the point where the groundwater in the aquifer would be drawn down by a quarter of a foot if the wellfield were pumping at its maximum capacity after an extended drought period. Since the original Northwest Wellfield Protection Plan viewed rockmining as a preferred land use over urban development, rockmining operations are exempt from most of the wellfield protection restrictions except setbacks between the wellheads and limestone quarrying. Present Dade County Code generally prohibits mining within a sixty day travel time, as shown in Figure 8, from the wellheads, which is approximately 1/2 mile.

The Committee reviewed computer modeling outputs which provided an initial assessment of the effects of various alternatives on the Northwest Wellfield. However, in order to fully address the legislative directive, to "develop a plan which....enhances the water supply for Dade County...," further assessment is needed. The wellfield protection program was established primarily to protect the water supply from septic tanks and hazardous materials spillage and may not adequately address potential impacts from microorganisms associated with surface water influences. Additionally, mining in the Lake Belt Area has the potential to change the classification of the source of water supply from "groundwater" to "ground water under the direct influence of surface water" which could result in significant modifications to the current water treatment process. To address these concerns, the Committee established a review group to determine what evaluations and/or modeling will need to be conducted during Phase II to protect the County's wellfields and "enhance the water supply for Dade County."

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Figure 8. Dade County Wellfields.
Two major wellfields are located in the Lake Belt Area. These wellfields are currently operated by Dade County. In 1985 the Dade County Commission passed resolution No. R-1541-85 adopting the Northwest Wellfield Protection Plan. For the wellfield protection area, the Land Use section of that plan states: *"urban development should be discouraged and limestone mining should be encouraged."*

Other Infrastructure

Substantial amounts of public and private infrastructure have been built within and around the Lake Belt Area. These represent both significant investments and constraints which have been taken into consideration in the development of the Lake Belt Plan. The major roads and highways are shown in Figure 9.

Figure 9. The Location of Major Highways.
These roads also provide the transportation arteries necessary to deliver rock products in Dade and Southern Broward Counties.

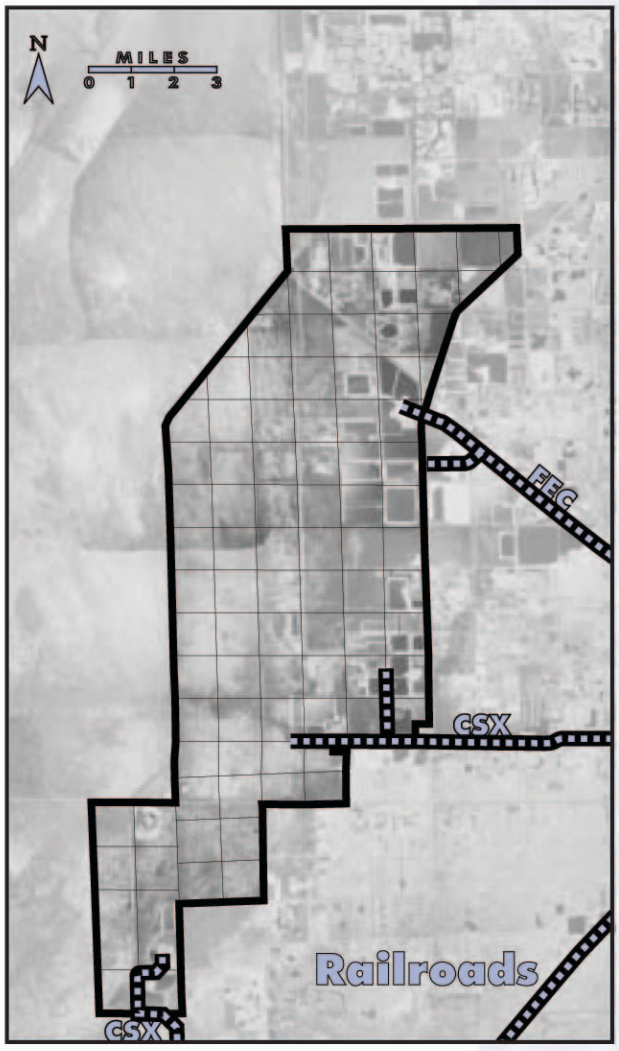

Figure 10. The Locations of Railroads that Serve the Lake Belt Rock Industry.
Railroads allow efficient and crucial transportation of Lake Belt rock products to areas beyond Dade and southern Broward County (which are served by truck). The Lake Belt presently supplies 1/2 of Florida's rock products to build public and private infrastructure.

Railroads play a significant role in transporting materials from the Lake Belt Area throughout the state. Rock from the Lake Belt Area is shipped by rail as far as Jacksonville. Figure 10 shows the location of the FEC and CSX railroad lines.

Florida Power and Light operates a 500kV power line, electric substations, and numerous lower voltage lines within the study area. In addition, a second 500 kV power line has been permitted to be constructed one mile west of the existing line. These are shown on Figure 11. The new line is intended to serve additional customers in South Florida and to increase system reliability. Although primarily owned by rockmining companies, the land between the two power lines is commonly referred to as "the FPL strip".

Other major public and private facilities in the Lake Belt Area and surrounding vicinity include a cemetery, local, state, and federal prisons, the Miccosukee Bingo Hall, a county owned airport, rock processing plants, several readimix concrete plants, and two of the four cement mills within the state. These are shown on Figure 12.

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Figure 11. Power Lines.
Major electric power lines and a substation supplying the Miami Area from the north traverse the Lake Belt Area.

Figure 12. The Location of Public and Private Facilities in the Lake Belt Area.
Substantial public and private infrastructure has been built in the Lake Belt Area. These existing facilities also affect the layout of quarries. This includes two well-fields, State and Federal Prisons, a major cemetery, an airport, a rendering plant, the Miccosukee Bingo Hall, a cement mill and several major rock processing plants.

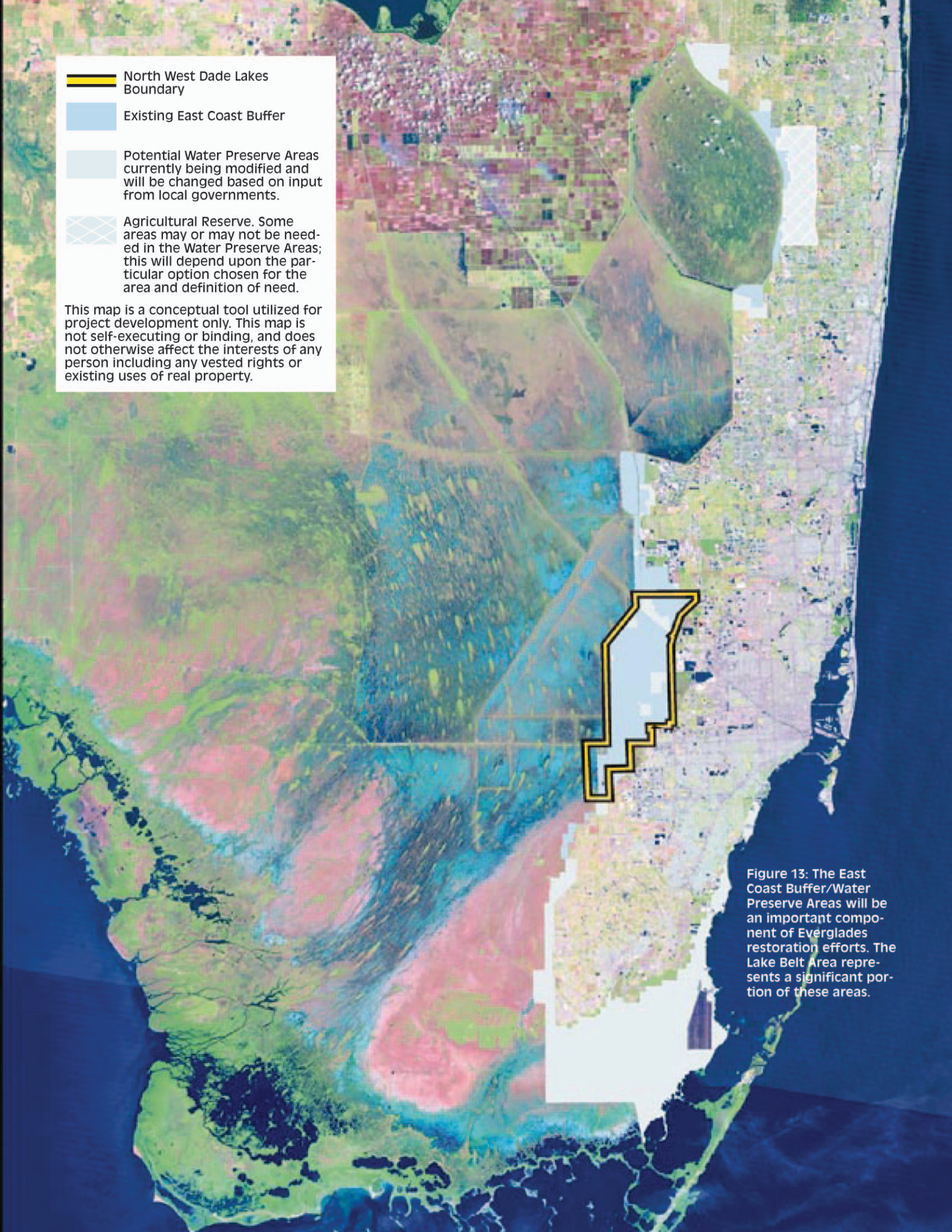

Figure 13: The East Coast Buffer/Water Preserve Areas will be an important component of Everglades restoration efforts. The Lake Belt Area represents a significant portion of these areas.

Ongoing Ecosystem Restoration Efforts

The development of the plan for the Lake Belt Area had to consider other significant efforts which are currently underway to help restore the Everglades ecosystem and provide for a sustainable South Florida. These efforts and their relationship to the Lake Belt Area are discussed below.

The USACE and the SFWMD are carrying out the Comprehensive Review study of the Central and Southern Florida Project **(Restudy)** to determine the feasibility of structural and operational modifications to the project that are essential to the restoration of the Everglades and South Florida ecosystems while providing for other water-related needs. The USACE completed a Reconnaissance Study in November 1994 which clearly demonstrated that the **East Coast Buffer / Water Preserve Areas** would need to be part of any Everglades ecosystem restoration project. The East Coast Buffer / Water Preserve Areas have the potential to enhance regional capabilities for meeting environmental, urban, and agricultural water demands while providing protection of wetlands outside the Everglades.

THE EAST COAST BUFFER / WATER PRESERVE AREAS ARE ENVISIONED AS A SERIES OF SURFACE WATER AREAS WHICH WOULD BE INTERCONNECTED AND MANAGED AS A SYSTEM OF MARSHLANDS, RESERVOIRS, AND/OR AQUIFER RECHARGE BASINS.

The East Coast Buffer / Water Preserve Areas are envisioned as a series of surface water areas which would be interconnected and managed as a system of marshlands, reservoirs, and/or aquifer recharge basins. The overall purposes of the project are to: (1) hold more water in the system by controlling seepage from the Everglades; (2) capture, store, and clean up excess stormwater currently lost to tide; (3) provide a buffer between the urban area and the Everglades; and (4) protect and conserve wetlands and habitat values outside the Everglades. Figure 13 on the previous page shows the Lake Belt Area in relation to the East Coast Buffer / Water Preserve Areas.

Another initiative is the **Governor's Commission for a Sustainable South Florida**. It was created by Executive Order 94-95 to make recommendations for achieving a healthy Everglades ecosystem that can coexist and be mutually supportive of a sustainable South Florida economy and quality communities. The Commission consists of 47 members. The Commission unanimously adopted its Initial Report to Governor Chiles on October 1, 1995. In several instances in the report, the Commission used the Northwest Dade County Freshwater Lake Plan effort as an example of how to work toward a more sustainable South Florida. Concerning the removal of melaleuca and other exotic vegetation the Report states that wetland regulatory agencies should:

- *provide for a credit for mitigation or other incentives where the removal of invasive exotic plants results in a passive future land use that maintains the wetlands, nature and functions of the area, such as the lake belt plan, mitigation bank, buffer area or other uses which deters active uses, provides environmental benefit and reduces the spread of invasive exotic plants.*

The Commission's Report endorsed the East Coast Buffer Project and identified the following ways for the Lake Plan to implement a significant portion of it:

- *The largest single opportunity for acquiring open space in the lower east coast area in proximity to urban areas is the Northwest Dade County Lake Belt Plan (1994) being investigated at the direction of the Florida Legislature. Up to 100 square miles in the proposed buffer zone between the urban areas and the Water Conservation Areas could be dedicated to recreation, ecotourism, open space, and water supply purposes. The Plan provides for a six-mile buffer between urban areas and the Water Conservation Areas, and comprises approximately 75% of the lands now being considered for the East Coast Buffer.*
- *The Commission should, during 1996, focus on the Northwest Dade County Lake Belt Plan and assist DCA, local governments, the SFWMD, and the South Florida Regional Planning Council in considering the plan and the implications and opportunities it presents for establishing recreation and buffer areas along the lower east coast.*

In the Commission's Conceptual Plan for the Restudy, completed August 28, 1996, the Commission reiterated the importance of the Lake Belt Plan.

- *"A public/private partnership may offset the cost or reduce the need for acquiring portions of the WPA (including but not limited to land donations, land swaps, and less than fee simple acquisitions). However, Lake Belt Plan development is proceeding in advance of the WPA design component of the Restudy. Coordination between these two planning efforts is necessary to avoid difficulties associated with Everglades restoration. It is*

important that the future lake plan be consistent with economic and environmental sustainability and flexible enough to ensure compatibility with South Florida natural system restoration and other objectives set forth by the Governor's Commission."

The Water Resources Development Act of 1996 specifically addressed Everglades restoration. The Conference Report dated September 25, 1996 provided additional direction, as reflected below.

- *"The Secretary shall develop, as expeditiously as practicable, a proposed comprehensive plan for the purpose of restoring, preserving, and protecting the South Florida ecosystem. The comprehensive plan shall provide for the protection of water quality in, and the reduction of the loss of fresh water from, the Everglades. The comprehensive plan shall include such features as are necessary to provide for the water-related needs of the region, including flood control, the enhancement of water supplies, and other objectives served by the Central and Southern Florida Project."*
- *"The Florida Legislature has recognized the importance of the Lake Belt Area of Dade County in ensuring a long-term domestic supply of aggregates, cement, and roadbase material. The Secretary [of the Army] is directed to take into consideration the Lake Belt Plan and its objectives as defined by the Florida Legislature, during development of the Comprehensive Plan."*

In December, 1996, the South Florida Ecosystem Restoration Working Group established the **Lake Belt Working Group Advisory Team** (Team). The purpose of the team is to "analyze a set of alternatives and recommend a preferred alternative that balances public need for construction aggregate, cement, and road base materials with: (1) environmental restoration goals for the Everglades, (2) regional water management goals, and, (3) achieving a 'no net loss' of wetland functions from mining activities." The preferred alternative recommended will form the basis for developing a programmatic Environmental Impact Statement and a proposal for a programmatic General Permit for mining in the Lake Belt Area. The recommended alternative also will provide guidance to the Restudy effort concerning the Lake Belt Area. The Team is tasked with preparing a report summarizing their work by April 1997. The Team will be building upon the work of the Committee since many of its members are also members of the Committee. ▼

Northwest Dade County Freshwater Lake Belt Plan

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Committee Work

Studies Undertaken

To provide the technical information necessary to develop the Lake Belt Plan, the Committee undertook several multi-year studies. These included a study of the wildlife habitat, mapping of the vegetation and soils, analysis of land uses, assessment of the water quality of the lakes, determination of the evapotranspiration rate of melaleuca, and detailed computer modeling of the hydrology of the Lake Belt Area.

The results from these studies were used by the Committee in developing a plan that best met all of the objectives identified by the legislature. The wildlife studies served as a basis for determining the appropriate mitigation to offset the impacts to wetlands from mining. The hydrologic modeling was used to evaluate the water resource implications of various configurations of lakes. The following pages present the key findings from the studies as they apply to the decisions and recommendations made by the committee. On page 28 is a list of the technical support documents produced by the Committee, including the persons to contact to obtain copies of the studies or additional information.

Mitigating Wetland Impacts

Two fundamental questions that needed to be analyzed through the Lake Belt planning process were: (1) how much mitigation is required to offset the impacts of converting freshwater wetlands to deep lakes? and (2) which wetlands should be preserved? In the early stages of the planning process, it was determined that additional information on the function and quality of the wetlands in the Lake Belt Area was needed before these fundamental questions could be answered. Therefore, environmental studies of the vegetation and wildlife in the area were initiated in early

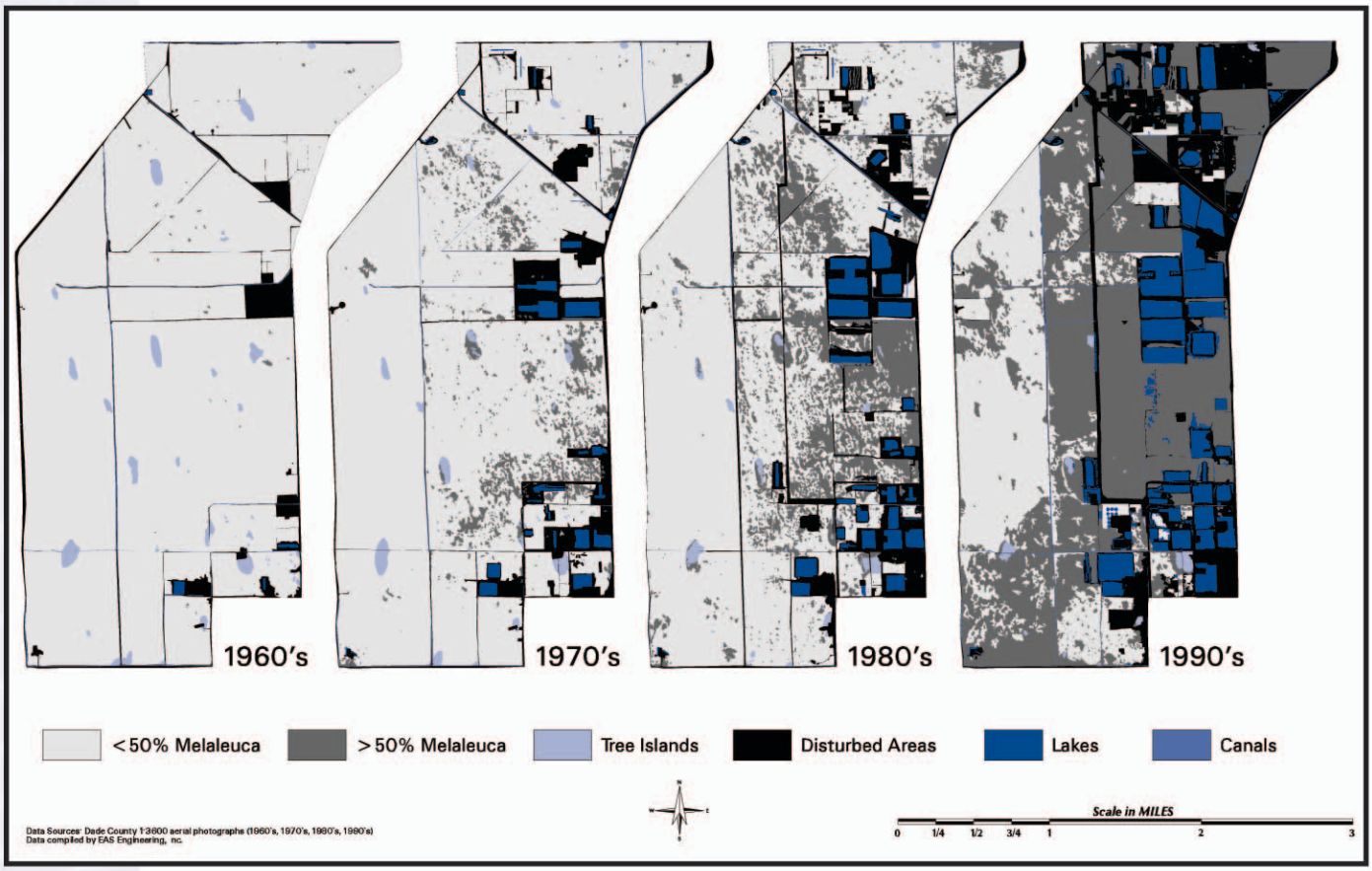


Figure 15. 1960 - 1990 Land Cover Changes in the Lake Belt Area from EAS Engineering Report.
Analysis of land cover changes was included in the cooperative studies.

1994. Since minimal information existed, one of the primary objectives of the environmental studies was to identify the function and quality of freshwater wetlands which had been invaded by the exotic melaleuca tree.

Figure 15 shows the changes in land cover that occurred from the 1960s until the 1990s. Figure 16, on the next page, shows the makeup and distribution of vegetation in the Lake Plan Area that was mapped in the vegetation study. Approximately 70% of the wetlands in the Lake Belt Area remain in a natural state; of this 23% is prairie with <10% melaleuca invasion, 13% is prairie with 10-50% melaleuca invasion, 11% is prairie with 50-75% melaleuca invasion, 51% is dense mature or sapling melaleuca forest, 1% is tree islands and willow heads. The majority of the prairie with <10% melaleuca occurs in the Pennsuco wetlands located west of the Dade/Broward levee. Fifteen of the 307 plant species found in the study area are categorized as threatened by the State of Florida.

Wildlife diversity and habitat use of melaleuca invaded wetlands was identified in the wildlife study. A total of 191 species and 24,643 individuals of native fish, birds, mammals, amphibians, reptiles and invertebrates were documented in the Lake Belt Area in the wildlife study. The wildlife study also revealed that wetlands impacted by melaleuca retain habitat values; for example, areas with 100% melaleuca provide habitat for 57% of the total native species found in the area.

Using the results of the environmental studies, the USACE, Florida Department of Environmental Protection (DEP), SFWMD and Metropolitan Dade County Department of Environmental Resources Management (DERM) collectively determined that a 2.5 : 1 enhancement mitigation ratio was appropriate for mining impacts within the Lake Belt Area. Specifically, the agencies recommended that for each wetland acre mined, 2.5 acres of wetlands within the Pennsuco wetlands be purchased, enhanced, and maintained in perpetuity. These ratios were established assuming a littoral area with an average width of 100' would be established around the excavated lakes. This mitigation ratio is lower than ratios proposed for impacts from other development activities in the area because the agencies agreed that quarried lakes with associated minimum littoral zones have a greater residual value than urban development in the setting of the Lake Belt Area. While this mitigation ratio for rockmining is still tentative due to federal requirements, efforts are underway to obtain agreement by all relevant agencies.

View of the Lake Belt Area Looking South from Water Conservation Area 3B.

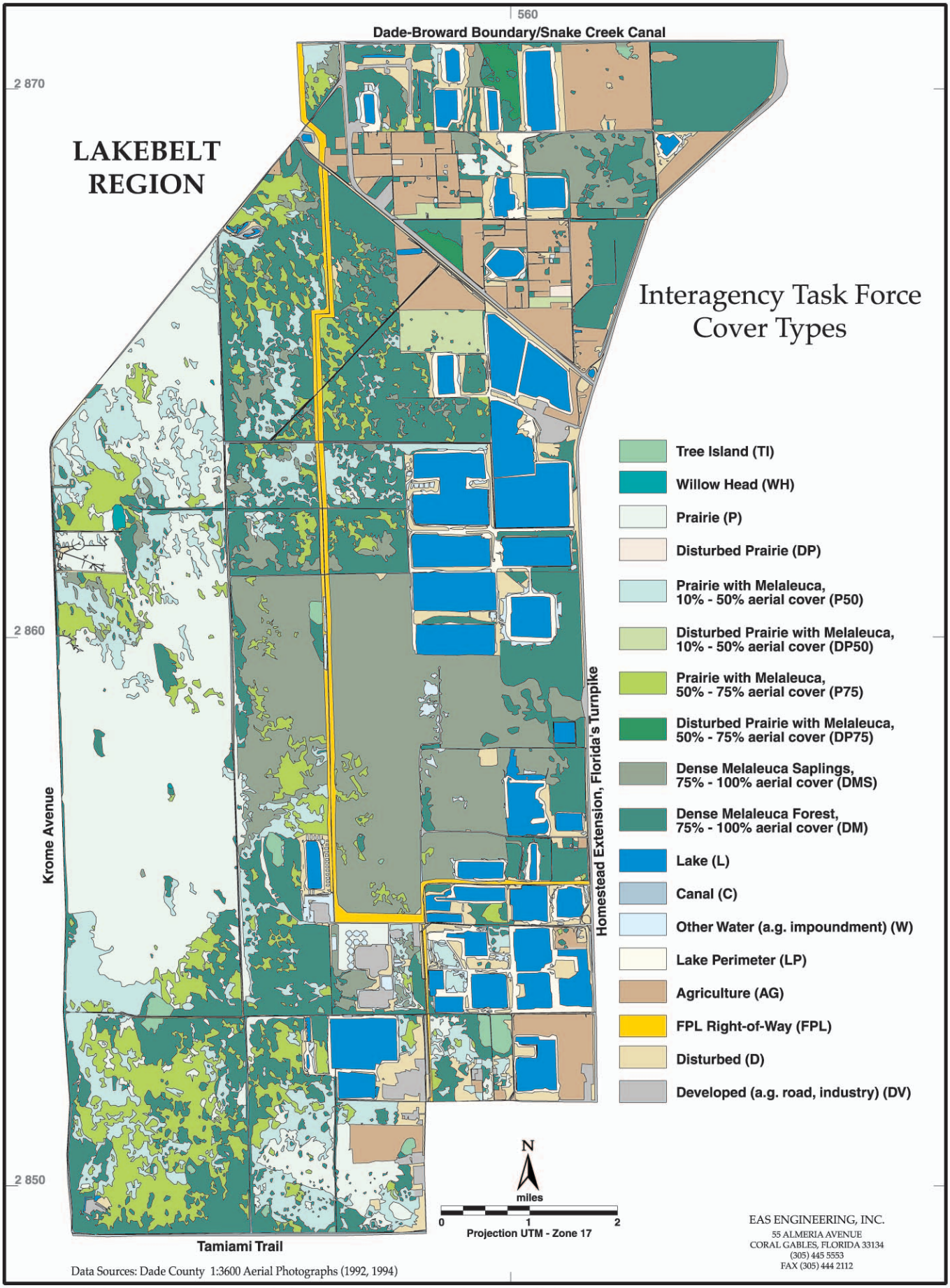


Figure 16. Vegetation Cover Types in the Lake Belt from EAS Engineering Report.
Habitat and vegetation studies of the Lake Belt Area were administered by DERM but cooperatively funded by the Mining Industry, Dade County, SFWMD and the USACOE.

Hydrologic Modeling

A multi-step computer modeling process was employed to determine the water resource implications of possible configurations of rockmining operations in the Lake Belt Area. Two primary types of hydrologic computer models were used. To determine the regional water resource implications of alternative configurations, the South Florida Water Management Model (SFWMM) was used. The SFWMM is an integrated surface water - ground water model that simulates the existing and proposed water management conditions in the entire Lower East Coast region. This model was developed in the early 1980s by the SFWMD and has been refined extensively since then. It has been used for a number of applications to evaluate proposed structural or operational changes to the regional water management system.

Relative to the Lake Belt Area, the SFWMM was used to evaluate the impacts of various mining configurations on certain environmental systems and urban water supply. The environmental systems which were assessed included the Water Conservation Areas (WCAs), Everglades National Park, Pennsuco wetlands, and Biscayne Bay. Urban water supply information obtained from the SFWMM included water shortage frequency and the volume of regional water deliveries.

A more detailed groundwater model was also developed to investigate the effects of various configurations for mining in the Lake Belt Area. Modeling showed that excavating lakes in the vicinity of the Northwest Wellfield reduced the drawdown in groundwater levels caused by pumping. The modeling

also showed that, as more lakes are dug in the vicinity of the wellfield, reliance on surface water deliveries from WCA-3B will diminish slightly. It is not clear, however, whether this reduction of deliveries from WCA-3B is a result of increased groundwater seepage out of WCA-3B into the lakes.

As additional lakes are excavated, there appears to be a trend of increasing seepage of groundwater from WCA-3B. The modeling results showed that the increase in seepage loss may be more significant during dry years such as 1989. Without offsetting water management measures as additional lakes are excavated, there also appears to be a trend of reduced hydroperiod and ponding depths within the Pennsuco wetlands, WCA-3B, and Everglades National Park, particularly in areas near lakes and canals. These hydrologic changes appear to be related to the specific location of additional lakes relative to the Water Conservation Areas, as well as the total area of the lakes.

A separate analysis utilizing a version of the groundwater model developed by the SFWMD specifically for this project, showed the importance of using water management facilities to control unwanted groundwater flow out of the Everglades. The placement of the Northwest Wellfield Protection canal, as well as the low water levels maintained at the west end of the Miami and Tamiami canals, appear to be a significant factor in loss of water from the Everglades and especially the Pennsuco wetlands through uncontrolled groundwater flows.

The modeling results reviewed by the Committee indicated that there are several water management options that could reduce seepage to levels below that which exists today with the full extent of mining envisioned in this plan. These measures, such as new water level controls in the Miami (C-6) and Tamiami (C-4) canals, which have been recommended as critical projects under the 1996 Water Resources Development Act, are standard engineering approaches that have been used successfully in other south Florida projects. ▼

Committee Recommendations

As directed by the enabling legislation, this Report provides the Committee's recommendations for legislative and regulatory revisions. The implementation of the Plan is being approached in two phases.

Figure 14, which appears on the center pages of this Report, summarizes the Committee's recommendations for the Phase I Lake Belt Plan. The map identifies the Committee's recommendation concerning the areas most appropriate for rockmining and the areas suitable as mitigation. The map also identifies lands owned by the rockmining industry that would be suitable for exchanging.

Phase I

provides the overall framework of the Plan and contains specific recommendations concerning:

- *streamlining the permitting process for rockmining within the Lake Belt Area;*
- *identifying areas for mining, mitigation, and additional analysis;*
- *establishing a dedicated funding mechanism for mitigation;*
- *authorizing government - industry land exchanges; and*
- *authorizing state agencies to enter into agreements to implement the Plan.*

Phase II

will result in a detailed master plan to further implementation that:

- *further addresses compatible land uses, opportunities, and potential conflicts,*
- *analyzes additional wellfield protection,*
- *secures additional funding sources, and*
- *considers the need to establish a land authority.*

Stockpile of Limestone Materials from Adjacent Quarried Lakes.

PHASE I

Wetland Protection and Mitigation

The Committee supports the principle that there be no net loss of wetland functions and values in the Lake Belt Area. To that end, the interagency mitigation strategy discussed earlier forms the basis for the mitigation requirements for offsetting impacts to wetlands resulting from limerock quarrying in the Lake Belt area. The mitigation strategy is based upon the wetland values and functions identified in the wildlife environmental study. The Committee recommends that rockmining mitigation requirements be met by establishing a user fee which would be paid per ton of limerock sold from the Lake Belt Area. The amount of the fee would be based upon the anticipated costs of offsetting impacts to wetland functions and values and would be indexed, perhaps to limerock product prices. The user fee will be stated separately on invoices to purchasers of limestone products.

The Committee supports the principle that there be no net loss of wetland functions and values in the Lake Belt Area.

Mitigation for rockmining in the Lake Belt Area should occur within the Pennsuco wetlands, the Northwest Bird Drive Basin, or other areas in the Lake Belt Area or Dade County, including in mitigation banks, as determined appropriate by the permitting agencies.

The SFWMD is currently acquiring lands within the Pennsuco wetlands with funding from the Save Our Rivers program. It is the Committee's intent that monies collected by the Lake Belt Area user fee will be used to reimburse other funding sources, such as Save Our Rivers or the Internal Improvement Trust Fund, for those lands which are acquired for rockmining mitigation.

The monies collected under the user fee process will be deposited into the existing Dade County Wetlands Trust Fund. This trust fund was established in 1992 to receive contributions as mitigation for projects in Dade County. Monies in the Trust Fund can only be disbursed for projects that result in the acquisition, restoration, enhancement, management or monitoring of wetland properties located within Dade County. Currently, disbursements from the fund are collectively agreed upon by a committee consisting of representatives of DERM, DEP, SFWMD, USACE, EPA, USFWS, and the Florida Game and Fresh Water Fish Commission. The fund is protected from "raiding" by the terms and conditions contained in interagency agreements and the Dade County Code which expressly prohibits the commingling of the funds or their use for any purpose other than disbursements as discussed above.

Off-site mitigation including melaleuca removal being performed at Thompson County Park.

Regulatory Certainty

The Committee supports the streamlining of permitting processes for rockmining operations in appropriate areas of the Lake Belt Area. In order to streamline the process, the DEP has agreed to coordinate with Dade County to pursue permitting delegation to DERM for limerock mining and reclamation activities within the Lake Belt Area. To further streamline the permitting process, the Committee also encourages the USACE to work with DEP and Dade County to establish a general permit under Section 404 of the Federal Clean Water Act for limerock mining activities within the Lake Belt Area consistent with the recommendations of this report. The Committee further encourages the USACE to delegate to DERM the implementation of any such general permit developed.

Figure 17 identifies the Committee's recommendation concerning the areas most appropriate for rockmining and the areas suitable for mitigation. The Committee supports rockmining, consistent with appropriate buffers for wellfields and urban development, in the areas shaded blue. In the areas with a blue hatching, rockmining was considered allowable, to the extent consistent with the Everglades restoration recommendations of the Comprehensive Plan of the C&SF Restudy due to be submitted to Congress by July 1, 1999. In the remaining shaded areas, the Committee concluded that development would result in significant environmental impacts and that the lands are suitable as mitigation. While the exact location of these lines may change due to further analysis by the Lake Belt Working Group Advisory Team (see p. 13), the majority of the voting members of the Committee supported this delineation.

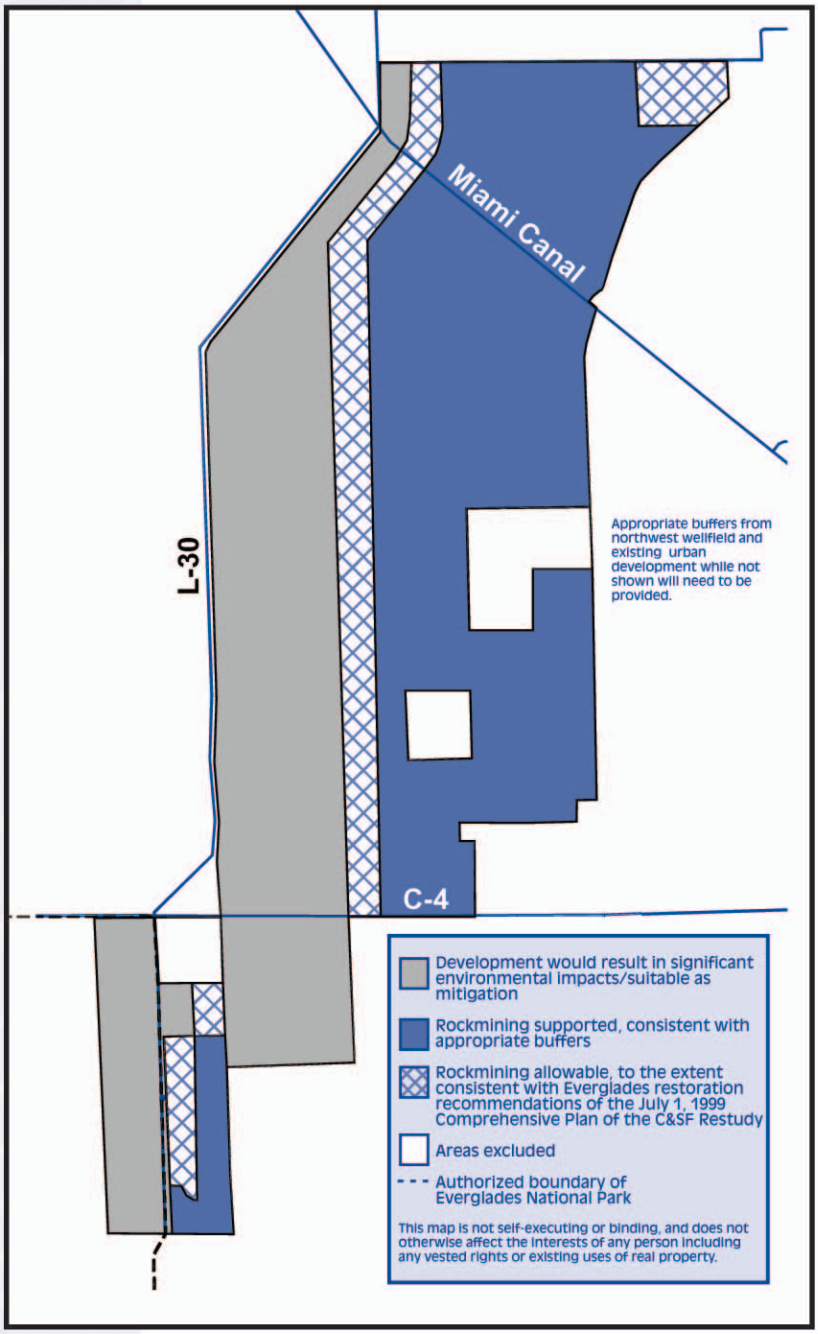


Figure 17. Recommended Rockmining Status

Land Exchanges

The Committee recommends that the Trustees of the Internal Improvement Trust Fund, the SFWMD, and Dade County be authorized to exchange government owned lands east of the Dade-Broward levee for rockmining industry owned lands in areas better suited for mitigation such as the Pennsuco wetlands or west of the L-31 N levee. It is the Committee's intent that monies collected by the Lake Belt Area user fee would be used to reimburse these agencies for those lands which are exchanged for rockmining mitigation. All such land exchanges would be on a willing seller basis. The purpose of the land exchanges is to protect the Pennsuco wetlands and Everglades National Park by concentrating rockmining in more appropriate areas east of the Dade-Broward levee. Figure 18 identifies government owned lands east of the Dade-Broward levee and rockmining industry owned lands in the Pennsuco wetlands.

In addition to being authorized to exchange lands currently owned, the Committee recommends that the Trustees of the Internal Improvement Fund, the SFWMD, and Dade County be specifically authorized to purchase land from willing sellers for the purpose of subsequently exchanging the land for rockmining industry owned lands.

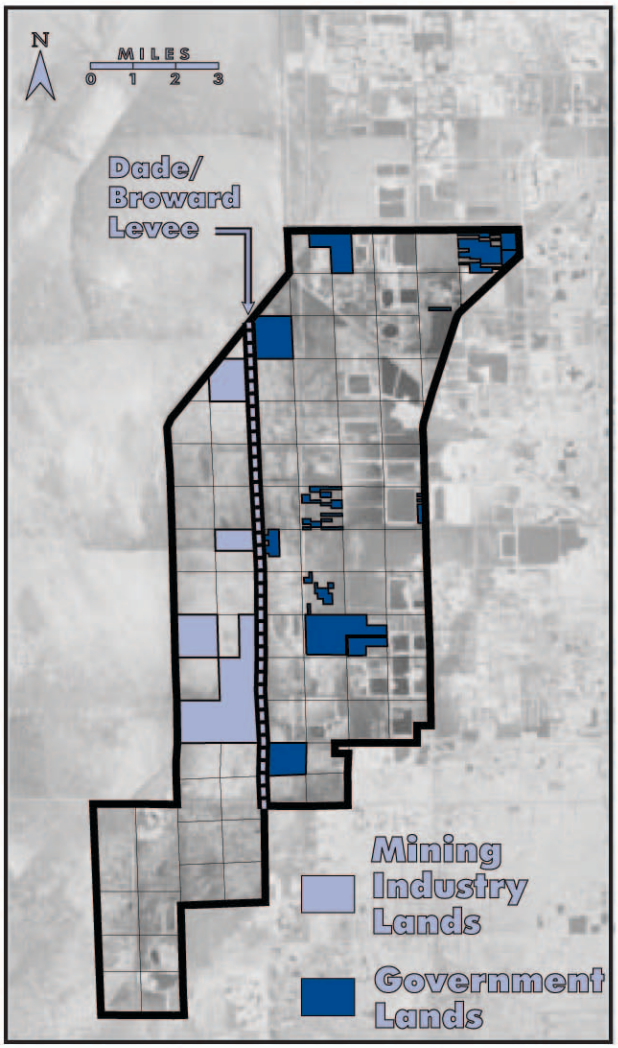


Figure 18. Possible Lands for Exchange in the Lake Belt Area for the Purpose of Consolidating Lands for Environmental and Mining Purposes.
One strategy for consolidating environmental and mining land is to exchange mining industry lands in the Pennsuco Wetlands for Government Lands in the mining area.

Land Use

The Committee recommends that local governments give weight to this plan in any future land use decisions in the Lake Belt Area. Specifically, the Committee recommends that Dade County not approve any local comprehensive plan amendments, zoning actions, or other development activities which would authorize residences or any other new land uses or development not currently approved that would be vulnerable to flood damage from increased water table elevations or increased duration of high water elevations. All uses which would reduce the potential utilization of water management options being considered as part of the Restudy should be held in abeyance until the Phase II detailed master plan for the Lake Belt Area is formulated and considered for approval by the Metropolitan Dade County Board of County Commissioners.

Implementation Agreements

The Committee recommends that state agencies and the SFWMD be authorized to enter into agreements with landowners, developers, businesses, industries, individuals, and governmental agencies to implement the Lake Belt Plan and any legislation enacted.

PHASE II

The Committee realizes that in addition to implementing the portions of the Plan outlined in Phase I, other issues will require attention and resolution in order to develop an effective Lake Belt Plan. The Committee recognizes the need to 1) develop a detailed master plan for the Lake Belt Area; 2) investigate activities necessary to enhance urban water resources; 3) secure funding sources for additional activities; 4) consider whether establishing a land authority would assist in effecting a Lake Belt Plan. These issues are discussed below and will be addressed in Phase II.

Detailed Master Plan

The Committee recommends that a detailed master plan for the Lake Belt Area be developed and adopted by the Metropolitan Dade County Board of County Commissioners in order to guarantee that future land uses, infrastructure, and recreational opportunities are compatible. A master plan is needed to fulfill the following goals: concentrate mining and ancillary facilities in appropriate areas, coordinate the Lake Belt Plan with the Restudy, protect private property rights, protect and enhance urban water resources, and enable compatible recreational use of appropriate areas. While future land uses must be consistent with Dade County's Comprehensive Development Master Plan and wellfield protection regulations, the Committee sees the need to develop a detailed master plan to achieve the foregoing goals, identify other compatible uses, eliminate the potential for future land uses and zoning changes that would conflict with these goals, and provide an access management plan for these areas. The Committee will recommend funding and organizational responsibilities and oversee the development of the detailed master plan.

Enhancement of Urban Water Resources

Dade County's existing wellfield protection program identifies allowable land uses within wellfield protection areas, setbacks from the wellheads for rockmining, restrictions on the use and storage of hazardous materials, and restrictions on wastewater and storm water disposal. However, the program was established primarily to protect the water supply from septic tanks and hazardous materials spillage and may not adequately address potential impacts from microorganisms associated with surface water influences. The Committee recommends that, during Phase II, the adequacy of the existing wellfield protection program be reviewed to determine whether modifications are necessary to guarantee the protection of the watershed and urban water supplies as the Lake Belt Plan is developed.

Secure Additional Funding Sources

While Phase I identifies a funding mechanism for mitigating impacts resulting from converting freshwater wetlands to quarried lakes, additional funding may be needed to implement other aspects of the Lake Belt Plan. As one example, funding may be needed for consolidating rockmining into appropriate areas. The Committee recommends that funding mechanisms be identified to develop and implement the Lake Belt Plan and that the sources of the funding be directly correlated to the benefits received by those providing the funding.

Consider Land Authority

During 1996, the Committee considered the possiblity of establishing a land authority to implement certain aspects of the Lake Belt Plan. While Committee consensus was not achieved, discussions included the potential for a land authority to assist in the consolidation of rockmining and environmentally sensitive lands into appropriate areas; the removal of exotic plants in the Lake Belt Area; the enhancement of littoral zones around quarried lakes; the acquisition and transfer of lands after mining is completed; and the protection of water supplies and watershed. The Committee will continue discussions on the land authority during Phase II and provide recommendations on whether or not a land authority should be created and the duties and powers of the land authority, if established. ▼

Summary of Key Points for 1997 Legislation

The Committee recommends that legislation be adopted by the Florida Legislature during the 1997 legislative session to implement the following Phase I actions. Where possible, any legislation resulting from the work of the Committee should avoid inconsistencies with the federal requirements.

- **Mitigation plan for Lake Belt Area**
  To obtain greater environmental benefits, a mitigation plan for rockmining in the Lake Belt Area should be established to replace the current situation of project by project mitigation

- **Interagency streamlining of permitting rockmining operations**
  Regulation of limerock mining should be delegated from DEP to Dade County DERM. Additionally, the USACOE should be encouraged to establish a General Permit for rockmining in the Lake Belt Area with permit compliance activities delegated to DERM.

- **Overall mitigation strategy embodied in a user fee**
  Impacts to wetlands resulting from limerock mining in the Lake Belt Area should be offset by establishing a user fee which would be paid per ton of limerock products sold from the Lake Belt Area. The amount of the fee should be based upon the anticipated costs of offsetting wetland impacts associated with rockmining.

- **Land exchanges and acquisition**
  Land exchanges between government and industry-owned lands should be authorized on a willing seller basis. The State, SFWMD and Dade County should be authorized to conduct such exchanges and to purchase lands specifically to effectuate such exchanges. Agencies should be reimbursed from the user fee for the value of lands used to implement the mitigation plan.

- **Implementation agreements**
  Agencies of the State, including the SFWMD, should be authorized to enter into agreements to implement the legislation and Lake Belt Plan.

- **Phase II**
  The sunset date for the Committee should be extended to January 1, 2001 in order to allow the Committee to complete the detailed master plan.

- **Committee Membership**
  The Department of Commerce representative should be replaced with the director of the Office of Tourism, Trade, and Economic development within the Office of the Governor. A representative of non-rockmining private landowners in the Lake Belt Area should be added to the Committee. A representative from the Florida Game and Fresh Water Fish Commission should be added to the Committee. The Committee should be provided explicit authority to appoint ex-officio members. Finally, Committee members should be provided the authority to designate alternates.

373.4149, Florida Statutes
Northwest Dade County Freshwater Lake Plan

(1) The Legislature recognizes that deposits of limestone and sand suitable for production of construction aggregates, cement, and road base materials are located in limited areas of the state.

(2) The Legislature recognizes that the deposit of limestone available in South Florida is limited due to urbanization to the east and the Everglades to the west, and that the area generally bounded by the Florida Turnpike to the east, the Dade-Broward County line to the north, Krome Avenue to the west and Tamiami Trail to the south is one of the few remaining high-quality deposits in the state available for recovery of limestone, and that the Dade County 1985 Northwest Wellfield Protection Plan encourages limestone quarrying activity in lieu of urban development in this area.

(3) The Northwest Dade County Freshwater Lake Plan Implementation Committee shall be appointed by the governing board of the South Florida Water Management District to develop a strategy for the design and implementation of the Northwest Dade County Freshwater Lake Plan. The committee shall be comprised of 13 members and 2 exofficio members, consisting of the chairman of the governing board or his designee of the South Florida Water Management District, who shall serve as chair of the committee, the policy director of Environmental and Growth Management in the Office of the Governor, the secretary or the secretary's designee of the Department of Environmental Protection, the director of the Division of Resource Management or its successor division within the Department of Environmental Protection, the secretary or the secretary's designee of the Department of Commerce, the secretary or the secretary's designee of the Department of Community Affairs, the director of the Department of Environmental Resource Management of Dade County, the Director of Planning in Dade County, a representative of the Friends of the Everglades, a representative of the Florida Audubon Society, a representative of the Florida chapter of the Sierra Club, and four representatives from the limestone mining industry to be appointed by the governing board of the South Florida Water Management District. The 2 exofficio seats on the committee will be filled by one member of the Florida House of Representatives to be selected by the Speaker of the House of Representatives from among representatives whose districts, or some portion of whose districts, are included within the geographical scope of the committee as described in subsection (2), and one member of the Florida Senate to be selected by the President of the Senate from among senators whose districts, or some portion of whose districts, are included within the geographical scope of the committee as described in subsection (2).

(4) The committee shall develop a plan which:

(a) Enhances the water supply for Dade County and the Everglades.

(b) Maximizes efficient recovery of limestone while promoting the social and economic welfare of the community and protecting the environment; and

(c) Educates various groups and the general public of the benefits of the plan.

(5) The committee shall remain in effect until January 1, 1999, and shall meet as deemed necessary by the chair. The committee shall monitor and direct progress toward developing and implementing the plan. The committee shall submit progress reports to the governing board of the South Florida Water Management District and the Legislature by December 31, 1994, and by December 31, 1995. These reports shall include a summary of the activities of the committee, updates on all ongoing studies, any other relevant information gathered during the calendar year, and the committee recommendations for legislative and regulatory revisions. The committee shall submit a final report and plan to the governing board of the South Florida Water Management District and the Legislature by December 31, 1996. This report shall include the final reports on all studies, the final recommendations of the committee, and other relevant information, and the committee's recommendation for legislative and regulatory revisions.

(6) After completion of the plan, the committee shall continue to assist in its implementation and shall report to the governing board of the South Florida Water Management District semiannually.

(7) In carrying out its work, the committee shall solicit comments from scientific and economic advisors and governmental, public, and private interests. The committee shall provide meeting notes, reports, and the strategy document in a timely manner for public comment.

(8) The committee is authorized to seek from the agencies or entities represented on the committee any grants or funds necessary to enable it to carry out its charge.

(9) The study area shall be extended to include land south of Tamiami Trail in sections 5, 6, 7, 8, 17, and 18, Township 54 South, Range 39 East, and to sections 11, 12, 13, 14, 23, 24, 25, 26, 35, and 36, Township 54 South, Range 38 East, all of which are located outside of Metro-Dade County's Current 2010 Urban Development Boundary Line. No additional biological studies will be required; however, computer hydrologic modeling, land use, and water quality studies may be necessary in the extended study area.

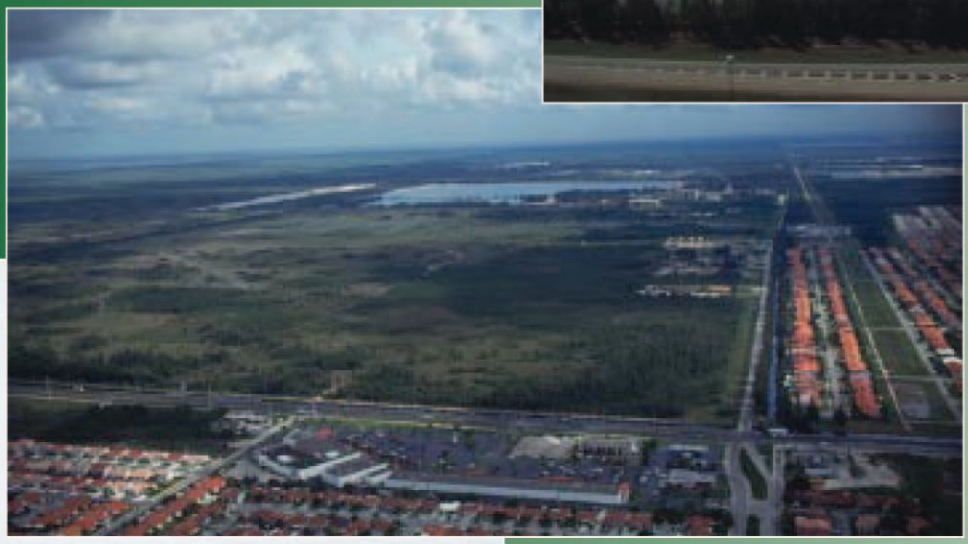
(10) The Legislature directs the committee and the Department of Environmental Protection to work with the United States Environmental Protection Agency and the Miami Dade Water and Sewer Authority Department to ensure that the Northwest Wellfield will retain its groundwater source classification for drinking water treatment standards. This determination shall be made utilizing hydrologic modeling and water quality studies. The committee shall seek funding for this study.

(11) The Legislature directs the South Florida Water Management District to oversee or carry out studies to determine evapotranspiration rates for melaleuca forest and prairie in the lakebelt area. Upon completion of the evapotranspiration study, the South Florida Water Management District shall incorporate study results as part of its overall water supply planning process. The committee shall seek funding for this study.

(12) The Legislature directs the Department of Commerce to oversee or carry out studies of the economic impact associated with the implementation of the lakebelt plan or any or its alternatives.

(13) This section is repealed January 1, 1999.

History.- s. 21, ch. 92-132; s. 5, ch. 94-122. ▼



Technical Support Documents

"Dade County Lake Belt Plan Wildlife Study - Final Report,"
Everglades Research Group, Inc., June 1996.
Contact: Sue Alspach, Dade County DERM, (305) 372-6580.

"Vegetation and Soils Mapping and Analysis, Lakebelt Ecological Studies, Dade County, Final Report,"
EAS Engineering, Inc., September 3, 1996.
Contact: Sue Alspach, Dade County DERM, (305) 372-6580.

"Lake Belt Land Use Report",
Metropolitan Dade County, December 1996.
Contact: Jean Evoy, Dade County DERM, (305) 372-6594.

"Lake Belt Mitigation Proposal,"
November 4, 1996.
Contact: Sue Alspach, Dade County DERM, (305) 372-6580

"Consequences of the Lake Belt Plan on Water Quality,"
Draft portion of programmatic Environmental Impact Statement, November 19, 1996.
Contact: Bill Porter, USACE, (904) 232-2259.

"Hydrologic Modeling of Initial Lake Belt Alternative Configurations Groundwater Modeling,"
Hydrologic Systems Modeling Division, Planning Department, SFWMD, March 1997.
Contact: Mark Wilsnack, SFWMD, (561) 687-6713.

"Hydrologic Modeling of Initial Lake Belt Alternative Configurations Regional Hydrologic Modeling,"
Hydrologic Systems Modeling Division, Planning Department, SFWMD, March 1997.
Contact: Narayanan Krishnan, SFWMD, (561) 687-6545 or
Jayantha Obeysekera, SFWMD, (561) 687-6503.

"Research Plan for the Study of Melaleuca Evapotranspiration,"
David A. Chin, Ph.D., College of Engineering, University of Miami, April 1996.
Contact: Wossenu Abtew, SFWMD, (561) 687-6326.

Questions or comments should be directed to: Jim Jackson, SFWMD, (561) 687-6334.

Credits

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Scott Benyon, Doug Bruce, David Chin, George Dalryrumple, Nancy Dalryrumple, Victor Dover, Jim Hurley, Mark Kraus, Steve Lamb, Paul Larsen, Alan MacVicar, Tom MacVicar, Bill Payne, Jack Peeples, Kevin Plut, Nanciann Regalado, Nancy Seith, Helenea Solo-Gabriele, Ed Swakon, Alberto Tamayo, Al Townsend

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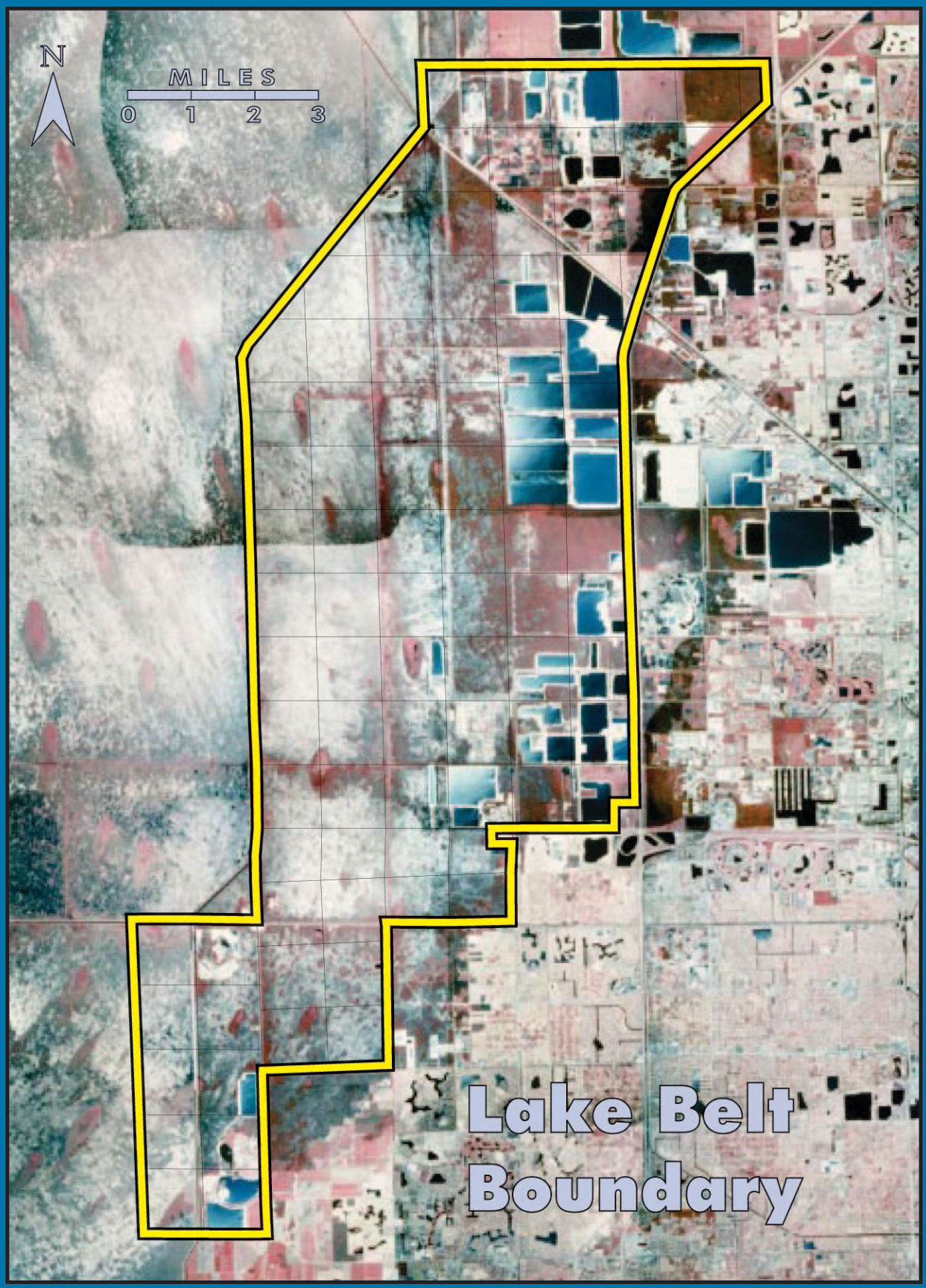
February 1997

Back Cover
Boundaries of the 89 square mile Lake Belt Area established by the Florida Legislature.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Lake Belt
Boundary